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Pediatricians' Attitudes and Beliefs toward Transgender People

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Patient and Public Involvement: Patients were not involved in this study.

Abstract

Objective: The number of transgender and gender non-conforming children is on the rise. For these children, the timing of medical intervention is crucial, yet transgender children report poorer overall physical and mental health outcomes compared to their cisgender peers. We aim to describe how pediatricians perceive transgender people.

Setting and Patients: The "Transgender Attitudes and Beliefs Scale", which consists of 29 items in three domains: Human value, Interpersonal comfort, and Sex/gender beliefs, was administered to senior and intern pediatricians. The responses, given on a seven-point Likert scale were collapsed into two categories; the mean score of ≥6 for each domain was a "Favorable" perception, and <6 "Unfavorable".

Results: Of 355 respondents, 221(62%) were females, 132(37%) males and 2 identified as "other"; 290(75%) were born in "trans-respect countries", 274(77%) identified as secular, 223(63%) were senior physicians, and 132(27%) interns. Overall, 90% of the cohort scored favorably on the "Human value" domain, 68% on "Interpersonal comfort", and 40% on "Sex\gender beliefs". In the "Interpersonal comfort" domain: male gender, birthplace in transphobic countries, religious identification, and being senior physicians, were all associated with increased odds ratios (ORs) for an unfavorable score; 2.1(95%CI 1.3-3.4), 3.4(95%CI 1.9-6.3), 2.4(95%CI 1.4-4.2), and 1.8(95%CI 1.1-3.0), respectively. In the "Sex\gender beliefs" domain, male gender and religious identification had significantly increased ORs for unfavorable scores, 2.2(95% CI 1.3-3.5) and 10.6(95% CI 4.7-24.1), respectively.

Conclusions: Negative attitudes toward transgender people are still widespread among pediatricians. Interventions are warranted to positively impact these attitudes.

Article summary: Strengths and limitations of this study

- In recent years, spotlight was turned to the pediatric transgender population. This study is the first to describe how pediatricians perceive them.

- The use of a previously validated, multidimensional questionnaire, allowed for a more complex view of perceptions. Score varied between the domains, and populations that traditionally are considers as having “negative views” did not score negatively in all domains.

- In this study we used convenience sample, which raises the possibility of selection bias between those who opted to complete the survey.

- The large cohort in this study along with the high response rate allows a better understanding of the barriers that this vuln able population still faces when it comes to receiving proper medical care.

- The majority of pediatricians acknowledged that transgender people should be treated according to basic human values, and most felt they could interact comfortably with transgender people. However, negative beliefs regarding transgender people are still common. As physicians' attitudes can affect patient management, and in light of the great importance of proper care by pediatricians for transgender and gender non-conforming children and youth, interventions to improve beliefs are warranted.

Introduction

Transgender is a term used to describe persons whose gender identity does not conform to the one assigned to them at birth. In the past decade, the medical community has turned a spotlight on the pediatric transgender population, in an attempt to remove barriers that may preclude proper care.[1] Pediatricians, who are on the front lines of this revolution, are becoming key figures for transgender and gender non-conforming (TGNC) children and youth. Firstly, accumulating evidence shows that the number of TGNC children is higher than previously thought.[2-4] According to a recent US population based study, 2.7% of teenagers in grades 9-11 self-defined as transgender.[5] These children increasingly seek medical aid or advice from their pediatricians.[1]

Secondly, for the children who seek medical intervention, time is in the essence, as current standard of care "puberty blockers" should be given at the onset of puberty.[6] Studies from the US and the Netherlands demonstrated drastically reduced risk for added comorbidities following treatment, as well as improved physical and psychological outcomes.[7-9] Thus, it is unfortunate that data also show that most children who were referred for treatment, were in fact older than the optimal age for intervention at presentation.[2 10] Moreover, even the establishment of a multidisciplinary gender clinic did not lead to a significant change in the age at presentation.[2]

Finally, transgender children report poorer overall physical and mental health outcomes compared to their cisgender peers, with greater prevalence of depression, anxiety, self-mutilation, substance abuse and suicide attempts. [2 5 11] This highlights the pediatricians' role as primary caregivers for this vulnerable population.

Despite the progress made, almost one-third of transgender people who responded to the US National Transgender Discrimination Survey, reported harassment in medical settings.[12] Similar numbers were reported by LGBT (lesbian, gay, bisexual, and transgender) parents seeking care for their children. [13]

Stigma can be defined as a set of negative beliefs about a group of people, and may result in discriminatory behavior. Physicians' stigma has long been established as a factor that can affect patient care, and even reduce the intention to treat. [14 15] Still, few studies to date have assessed physicians' attitudes toward TGNC, and pediatricians' attitudes have not been reported.

We sought to describe pediatricians' attitudes toward transgender people, and to assess whether certain demographic and occupational characteristics of pediatricians are associated with more negative perceptions.

Methods

Study design and participants

In this prospective study, senior and intern pe5diatricians were approached randomly at two semi-annual pediatric assemblies, at seven hospitals, and in five community clinics. At all locations, pediatrician identity was verified using a nametag or employee card, and the last four digits of the national personal identify number were recorded to avoid duplications. Consent was obtained; participation was elective, and anonymous.

A total of 391 physicians were approached between July 2017 and July 2018. After data-screening, 368 participated, the final study cohort comprised 355 pediatricians, as 13 failed to fill the full questionnaire. The study was approved by the Helsinki committee of Sheba Medical Center.

Materials

The previously validated "Transgender Attitudes and Belief Scale" (TABS) questionnaire was chosen as the instrument for this study.[16] TABS demonstrated particular ability in capturing attitudes to transgender, compared to other scales that have been administered to medical personnel.[17] Detailed information about validation of the questionnaire has been reported elsewhere. [16] TABS consists of 29 items in three domains: 1) "Human values" domain (5 items), which assesses an individual's inherent value, for example: "Transgender individuals are valuable human beings regardless of how I feel about transgenderism". 2) "Interpersonal comfort" domain (14 items), which measures the respondent's level of comfort in daily interactions with transgender people, for example "If I were introduced to a transgender person at a party, I would feel comfortable having a polite conversation with that person". 3) Sex and gender beliefs domain (10 items), which assesses underlying beliefs in regard to gender, for example: "A person who is not sure about being male or female is mentally ill".

Responses on TABS were rated on a seven-point Likert scale for each item, and ranged between 1 "strongly disagree" and 7 "strongly agree". To minimize bias, the questionnaire includes a mix of positively and negatively stated items; negatively stated items were coded as "R", and their scores were later analyzed in reverse. Higher scores indicate positive perceptions. The possible raw ranges of each of the domains of the questionnaire are 5 to 35 for Human values, 14 to 98 for Interpersonal comfort, and 10 to 70 for Sex and gender beliefs.

The TABS questionnaire was translated according to the guidelines for translating and

adapting tests issued by the international test commission (ITC). [18]

In addition to the questionnaire, demographic occupational details were reported by the participants. The details recorded were gender ("Male", "Female" or "Other", birth country as an open-ended question; religious identification as "Secular" or "Religious"; seniority as "Seniors" or "Interns", and the location of their primary practice as "Community clinic" or "Hospital (for senior physicians only).

Data analysis

According to currently accepted guidelines for analyzing data of Likert-Type Scales, differences between responses should not be assumed to be equidistant. [19]

Pediatricians' answers, given on a seven-point Likert scale were collapsed into two categories; an equivalent of mean ≥6 for a specific domain was considered a favorable perception. Lower scores (<6) were categorized as "Unfavorable".

Pediatrician origin was categorized according to "Trans-respect" versus "Trans-phobic" birth country, to assess the effect of cultural background on perceptions. The categorization was delineated in the updated “Legal and Social Map” issued by the organization, Transgender Europe (TGEU), and is based on political processes, and legal and social practices that concern transgender. [20]

For example, the US, most European countries and Israel are considered as "Trans-respecting" because of legal recognition for gender change, anti-discrimination legislation, and trans-specific health care services.

Statistical analyses

Statistical analyses were performed using SAS version 9.4 (SAS Institute Inc., Cary, NC). Descriptive statistics are presented as number (percentages) and the median and IQR values. Univariate analysis was used to determine relations between demographic groups and scales scores. The scales were once analyzed as a continuous score, and once according to dichotomous categories: Interpersonal comfort (below 84, greater or equal to 84), Sex and gender beliefs (below 60, greater or equal to 60), Human value (below 30, greater or equal to 30). Scores using the continuous scales did not follow a normal distribution and therefore were reported by median and interquartile ranges, and compared using the two sample Wilcoxon test or Kruskal Wallis test according to the number of groups compared. Categorical variables were reported by their relative frequencies and compared by the Pearson Chi-Square test. When results of the overall test were statistically significant, pairwise comparisons were performed. The Bonferroni method for adjustment of significance level was used. Spearman coefficients were calculated to examine associations between the scales. Multivariate logistic regressions were applied to the data to identify the significant independent predictors of the below-threshold values of each of the three scales. The predictors in each regression were sex, secular (yes vs. no), seniority (yes vs.no) and birth-place. A p value of 0.05 was considered significant.

Results

The study cohort comprised 355 pediatricians, 221 (62%) females, 133 (37%) males and 2 "others"; 290 (75%) were born in "trans-respect" countries, 274 (77%) defined themselves as secular, 132 (37%) were interns. Of the 223 (63%) senior pediatricians, 124 (56%) worked mainly in hospitals, and 102 (44%) mainly in community practice clinics. The median age of the participants was 40 years [IQR 33:54]. For each of the

three domains (Human value, Interpersonal comfort, and Sex/gender beliefs), scores were significantly higher for females than males, for secular than religious, and for respondents born in trans-respect compared to transphobic countries (Table 1). For the domain of Interpersonal comfort, but not for the other two domains, interns scored significantly higher than senior physicians.

Overall, 90% of the pediatricians scored favorably (mean score ≥6) on the Human values domain, 68% on the Interpersonal comfort domain, and only 40% on the Sex/gender beliefs domain.

Subsequent analysis characterized the pediatricians who scored unfavorably (Table 2). All variants were found statistically significant on univariate analysis, and were subsequently included in the multivariate model: "male" gender, "transphobic" birthplace, religious identification and being a senior physician increased the odds ratio for an unfavorable score, for both the Interpersonal comfort domain and the Sex\gender beliefs domain). These trends were also observed among the senior physicians, between those working in the community and those working in hospitals. Since only 10% held "unfavorable" attitudes regarding the human values domain, further analysis was not done.

In the multivariate analysis (Table 3, Figure 1 a-d) of the Interpersonal comfort domain, odds ratios (ORs) for an unfavorable response were 2.1 (95% CI 1.3-3.4) for males vs. females, 3.4 (95% CI 1.9-6.3) for respondents born in transphobic vs. trans-respect countries, 2.4 (95% CI 1.4-4.2) for religious vs secular identification, and 1.8 (95% CI 1.1-3.0) for senior vs. intern pediatricians. In a sub-analysis of senior pediatricians, no statistically significant difference was found between those working

primarily in the community versus hospitals; the OR of an unfavorable response was 1.7 (95% CI 0.97-3.14) for mainly community vs. mainly hospital pediatricians.

For the sex and gender beliefs domain, the OR for an unfavorable response was 2.2 (95% CI 1.3-3.5) for males vs. females, 1.7 (95% CI 0.9-3.3) for being born in a transphobic vs. trans-respect country, 10.6 (95% CI 4.7-24.1) for religious vs secular pediatricians, and 1.5 (95% CI 0.9-2.4) for senior vs intern pediatricians. In a sub-analysis of senior pediatricians, no significant difference was found, the OR of an unfavorable response was 1.4 (95% CI 0.7-2.6) for those working mainly in the community vs mainly in the hospital.

Discussion

In this study of attitudes toward transgender people, 90% of pediatricians acknowledged the universal human value of transgender people, yet only two-thirds reported that they would feel comfortable interacting with transgender people, and most pediatricians displayed negative underlying sex/gender beliefs in regard to transgender. Additionally, certain characteristics of the respondents significantly increased the probability of having unfavorable perceptions: being male, born in a transphobic country, religiously identified and a senior physician rather than an intern increased the probability of not feeling "Interpersonal comfort" in relation to transgender people; and being male and religiously identified increased the probability of having negative sex and gender beliefs.

We presume that the interpersonal comfort domain in the context of this study reflects interactions during medical encounters behind closed doors. Considerable previous works assessed interactions from a transgender point of view,[12 21] or by LGBT

parents, [13] and thus provide indirect measurements of physicians' degree of comfort. Our work is the first to directly assess the pediatricians' degree of comfort and may explain results of previous indirect findings.

The sex/gender beliefs domain of the TABS reflects convictions that are held to be true without empirical evidence. Sixty-percent of the pediatricians in the current study expressed stigma regarding gender fluidity, despite the fact that only one-third reported they would feel interpersonal discomfort. This is an important distinction and may result in oblivious discrimination against transgender children.

The odds ratio for male pediatricians to feel less at ease when interacting with transgender persons, and for having negative gender beliefs was two-fold higher that of females. These findings corroborate previous data that showed that female physicians engage in significantly more active partnership behaviors, positive talk, psychosocial counseling, psychosocial question asking, and emotionally focused talk than do male physicians. [22] It has also been suggested that men are more invested than women in adhering to gender norms, because they serve to affirm their own masculinity.[23 24]

Pediatricians born in "transphobic" rather than "trans-respect" countries expressed less comfort in interacting with transgender people; however, unfavorable sex/gender beliefs were high in both groups, with no significant difference. This is an important finding. While research has shown that contact and exposure in a variety of cultural dimensions positively correlates with more favorable attitudes towards a person with whom contact is made, [25] our data suggest that educational programs are needed irrespective of place of birth.

Religiosity was associated with a twofold increased risk of being uncomfortable with transgender people, and a tenfold increased risk of having stigmatizing gender beliefs. This concurs with previous studies that showed a lack of openness toward gender fluidity among religious physicians and health care staff. [26-28] Most religions still hold traditional fixed beliefs in regard to gender; other studies similarly found a correlation of increased religiosity with more negative attitudes toward transgender persons. [29-31]

Senior physicians expressed greater feelings of discomfort with transgender people than did interns. However, similar to the characteristic of cultural background, unfavorable sex/gender beliefs were high in both groups, with no statistically significant difference. Previous studies revealed conflicting results regarding a correlation between younger age and more favorable attitudes. The "generational replacement" hypothesis suggests that attitudes change due to younger generations growing up in a more open and accepting atmosphere; and that this, together with generation replacement, is a core tenet in attitude change.[32 33] Accordingly, interns in the US, in contrast with senior physicians, showed more tolerant attitudes regarding various issues, such as substance abuse.[34] However, the findings of the current study suggest that negative sex/gender beliefs are more persistent than feelings of discomfort in interrelating with transgender persons.

While pediatricians working in hospitals are exposed to an academic environment characterized by openness and progress, they did not express greater comfort in dealing with transgender encounters, and did not show less stigmatization, compared with pediatricians in the community.

Transgender children are an especially vulnerable population that is still subject to

many barriers. While we have shown that pediatricians may have negative attitudes that can affect care, such attitudes were shown to be modifiable, using anti-stigma programming, [35] as has been done with mental illness and HIV.[36-39] Targeted contact-based interventions have demonstrated particular effectiveness.[40 41]

This study has some limitations. We used a convenience sample, which raises the possibility of selection bias, as characteristics may have differed between those who agreed and did not agree to participate, or to complete the survey. However, only 6% of those approached did not complete the survey, and only 3.5% of those who started the survey did not complete it. Moreover, we would expect that those who completed the survey might have more positive attitudes than those who did not. Negative beliefs may have a complex impact on behavior, and we only assessed interpersonal comfort; this could portray an oversimplified picture. We set a high standard for favorable attitudes; our cutoff required at least six on a seven-point Likert scale. The strengths of this study are the large sample of pediatricians with a high response rate, the use of a previously validated instrument, and analysis by characteristics of the respondents.

In summary, an overwhelming majority of pediatricians acknowledged that transgender people should be treated according to basic human values, and most felt they could interact comfortably with transgender people. However, the majority reported negative beliefs regarding transgender people. As physicians' attitudes can affect patient management, and in light of the great importance of proper care by pediatricians for transgender and gender non-conforming children and youth, interventions to improve beliefs are warranted.

Legends

Table 1. Median values and ranges of scores on the Transgender Attitudes and Beliefs Scale, according to characteristics of the respondents.

Table 2. Responses of pediatricians to two domains of the Transgender Attitudes and Beliefs Scale, according to demographic characteristics.

Table 3 - Multivariate analysis of an overall unfavorable (<6) vs. favorable (≥6) response on two domains of the Transgender Attitudes and Beliefs score, according to characteristics of the respondents

Figure 1 : Multivariate analysis of an overall unfavorable (<6) vs. favorable (≥6) response on two domains of the Transgender Attitudes and Beliefs score, according to characteristics of the respondents

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- **What is already known on this topic**?
  - One-third of transgender people reported harassment in medical settings. Similar numbers were reported lesbian, gay, bisexual, and transgender parents seeking care for their children
  - Physicians' stigma has long been established as a factor that can affect patient care, and even reduce the intention to treat

- **What this study adds?**
  - Ninety-percent of the pediatricians scored favorably on the Human values domain, 68% on the Interpersonal comfort domain, but only 40% on the Sex/gender beliefs domain.
  - Unfavorable response in the Interpersonal comfort domain were significantly higher in males, pediatrician's born in transphobic countries, religious identification, and senior pediatricians
  - In the Sex\gender beliefs" domain, females and secular physicians had lower OR for unfavorable response, however, negative attitudes were widespread irrespective seniority or birthplace.

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Table 1. Median values and ranges of scores on the Transgender Attitudes and Beliefs Scale, according to characteristics of the respondents.

Characteristics	N (%)	Human Value (5-35)	Interpersonal Comfort (14-98)	Sex / Gender Beliefs (10-70)	Human Value (5-35)
All	355 (100)	35 (34, 35)	86 (75,94)	57 (46,64)	35 (34, 35)
Gender					
Female	221 (63)	35 (35,35)	89 (78,95)	59 (50,64)	35 (35,35)
Male	132 (37)	35 (31,35)	82 (64,92)	53 (42,61)	35 (31,35)
p		<0.001	<0.001	<0.001	<0.001
Religiosity					
Secular	274 (77)	35 (35, 35)	89 (77, 95)	59 (52, 64)	35 (35, 35)
Religious	81(23)	35 (30, 35)	80 (59, 88)	44 (33, 53)	35 (30, 35)
p		<0.001	<0.001	<0.001	<0.001
Birth country**					
Transrespect	290 (75)	35 (35, 35)	88 (78, 95)	58 (49,64)	35 (35, 35)
Transphobic	65 (25)	34 (29, 35)	76 (60, 87)	48 (40, 61)	34 (29, 35)
p		<0.001	<0.001	<0.001	<0.001
Experience					
Senior physician	223 (63)	35 (33,35)	84 (71,93)	56 (45,63)	35 (33,35)
Intern	132 (37)	35 (35,35)	90 (80,95)	58 (47,64)	35 (35,35)
p		0.037	0.001	0.13	0.037

**The categories of "Trans-respect" versus "Trans-phobic" are based on political processes, and legal and social practices that concern transgender.

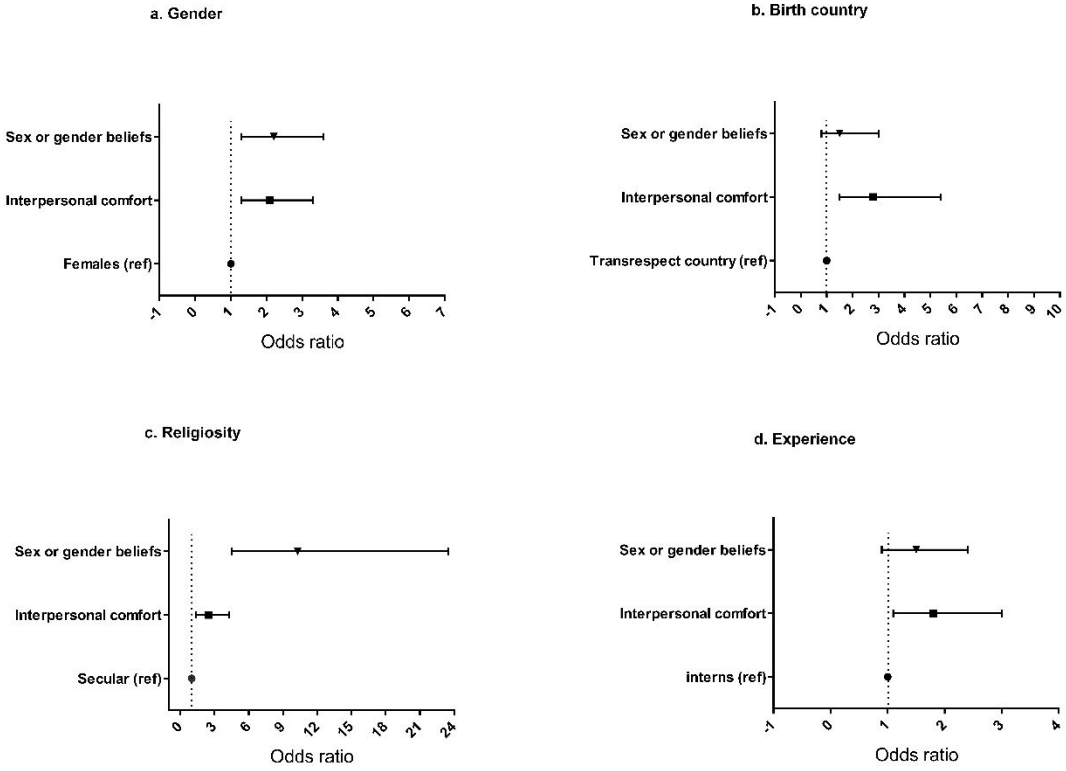
Table 2. Responses of pediatricians to two domains of the Transgender Attitudes and Beliefs Scale, according to demographic characteristics.

		Interpersonal comfort N (%)		Sex \ gender beliefs N (%)	
Variable		**Unfavorable (N=150)**	**Favorable (N=205)**	**Unfavorable (213)**	**Favorable (N=142)**
Gender					
	Female n=221	76 (34%)	145 (66%)	117 (53%)	104 (47%)
	Male n=132	73 (55%)	59 (45%)	95 (72%)	37 (28%)
p		<0.001		<0.001	
Birth country					
	Transrespect n=290	106 (37%)	184 (63%)	167 (58%)	123 (32%)
	Transphobic n=65	43 (66%)	21 (44%)	46 (71%)	19 (29%)
p		<0.001		0.06	
Religiosity					
	Secular n=274	103 (38%)	171 (62%)	139 (51%)	135 (49%)
	Religious n=81	47 (58%)	34 (42%)	74 (91%)	7 (9%)
p		0.001		<0.001	
Experience					
	Interns (n=132)	40 (30%)	92 (70%)	69 (52%)	63 (48%)
	Seniors (n=223)	110 (49%)	113 (51%)	144(65%)	79 (35%)
p		<0.001		0.022	
		Unfavorable (N=106)	**Favorable (N=113)**	**Unfavorable (141)**	**Favorable (N=78)**
Location of primary practice for senior pediatricians (n=219)					
	Hospital (n=124)	50 (40%)	74 (60%)	75 (60%)	49 (40%)
	Community (n=95)	56 (59%)	39 (41%)	66 (69%)	29 (31%)
p		<0.01		0.17	

Responses of ≥6 on a 7-point Likert scale were considered "Favorable". Responses of <6 were considered "Unfavorable".

Table 3 – Multivariate analysis of an overall unfavorable (<6) vs. favorable (≥6) response on two domains of the Transgender Attitudes and Beliefs score, according to characteristics of the respondents

	Interpersonal comfort		**Sex /gender beliefs**	
Effect	Odds ratio (95% CI)	p	Odds ratio (95% CI)	p
Gender				
Male	2.1 (1.3-3.4)	0.0013	2.2 (1.3-3.5)	0.0032
Female	1		1	
Birth place				
Transphobic	3.4 (1.9-6.3)	<0.0001	1.7 (0.9-3.3)	0.0837
Transrespect	1		1	
Religiosity				
Religious	2.4 (1.4-4.2)	0.0011	10.6 (4.7-24.1)	<0.0001
Secular	1		1	
Seniority				0.1331
Senior	1.8 (1.1-3.0)	0.0139	1.5 (0.9-2.4)	
Intern	1			



STROBE Statement—Checklist of items that should be included in reports of ***cohort studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	5
		(*b*) For matched studies, give matching criteria and number of exposed and unexposed	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6
Bias	9	Describe any efforts to address potential sources of bias	
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	7
		(*c*) Explain how missing data were addressed	7
		(*d*) If applicable, explain how loss to follow-up was addressed	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7
		(b) Give reasons for non-participation at each stage- not relevant	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	7
		(b) Indicate number of participants with missing data for each variable of interest	
		(c) Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	Report numbers of outcome events or summary measures over time	

Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included (*b*) Report category boundaries when continuous variables were categorized (*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	8
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	9
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10
Generalisability	21	Discuss the generalisability (external validity) of the study results	12
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Not relevant

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.

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Paediatricians' Attitudes and Beliefs toward Transgender People- A Cross-Sectional Survey in Israel

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Paediatricians' Attitudes and Beliefs toward Transgender People- A Cross-Sectional Survey in Israel

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Abstract

Objective: The number of transgender and gender non-conforming children is on the rise. For these children, the timing of medical intervention is crucial, yet transgender children report poorer overall physical and mental health outcomes compared to their cisgender peers. We aim to describe how paediatricians perceive transgender people.

Setting: The "Transgender Attitudes and Beliefs Scale", which consists of 29 items in three domains: Human value, Interpersonal comfort and Sex/gender beliefs, was administered to 391 senior and resident paediatricians in Israel. The responses, on a seven-point Likert scale were collapsed into two categories; the mean score of ≥6 for each domain was a "Favourable" perception, and <6 "Unfavourable".

Results: Of 355 respondents (91% response rate), 221(62%) were women, 132(37%) men and 2 identified as "other"; 290(82%) were born in "trans-respect countries", 274(77%) identified as secular, 223(63%) were senior physicians and 132(27%) residents. Overall, 90% of the cohort scored favourably on the "Human value" domain, 68% on "Interpersonal comfort" and 40% on "Sex\gender beliefs". In the "Interpersonal comfort" domain: being a man, birthplace in a transphobic country, identification as religious, and being a senior physician, were all associated with increased odds ratios (ORs) for an unfavourable score; 2.1(95%CI 1.3-3.4), 3.4(95%CI 1.9-6.3), 2.4(95%CI 1.4-4.2) and 1.8(95%CI 1.1-3.0), respectively. In the "Sex\gender beliefs" domain, being a man and identifying as religious had significantly increased ORs for unfavourable scores, 2.2(95% CI 1.3-3.5) and 10.6(95% CI 4.7-24.1), respectively.

Conclusions: Negative attitudes toward transgender people are still widespread among paediatricians. Interventions are warranted to positively impact these attitudes.

Article summary: Strengths and limitations of this study

1. Paediatricians are key figures in the care of transgender children, yet data are sparse regarding their perceptions of transgender persons, we therefore studied this important issue.

2. The response rate of the paediatricians was high.

3. A previously validated, multidimensional questionnaire was used.

4. A limitation of the study is that variables such as education, knowledge and years since immigration to Israel were not assessed.

Introduction

Transgender is a term used to describe persons whose gender identity does not conform to the one assigned to them at birth. In the past decade, the medical community has turned a spotlight on the paediatric transgender population, in an attempt to remove barriers that may preclude proper care.[1] Paediatricians, who are on the front lines of this revolution, are becoming key figures for transgender and gender non-conforming (TGNC) children and youth. Firstly, accumulating evidence shows that the number of TGNC children is higher than previously thought.[2-4] According to a recent US population based study, 2.7% of teenagers in grades 9-11 self-defined as transgender.[5] These children increasingly seek medical aid or advice from their paediatricians.[1]

Secondly, for the children who seek medical intervention, time is in the essence, as current standard of care "puberty blockers" should be given at the onset of puberty.[6] Studies from the US and the Netherlands demonstrated drastically reduced risk for

added comorbidities following treatment, as well as improved physical and psychological outcomes.[7-9] Thus, it is unfortunate that data also show that most children who were referred for treatment were in fact older than the optimal age for intervention at presentation.[2 10] Moreover, even the establishment of a multidisciplinary gender clinic did not lead to a significant change in the age at presentation.[2]

Finally, transgender children report poorer overall physical and mental health outcomes compared to their cisgender peers, with greater prevalence of depression, anxiety, self-mutilation, substance abuse and suicide attempts. [2 5 11] Yet, psychopathology is not inevitable within this group; transgender children who are supported in their gender identity have been shown to have developmentally normative levels of depression and only minimal elevations in anxiety.[12] As the first medical provider that transgender youth and their families generally encounter, the paediatrician has a critical role in supporting social transition and affirmation, and in coordinating appropriate referrals and follow-up. [13] Recent years have attested to increasing public awareness regarding gender identity. Further, a policy statement issued by the Endocrine Society provides guidance for clinicians according to a gender-affirming approach.[6] Nonetheless, almost one-third of transgender people who responded to the US National Transgender Discrimination Survey reported harassment in medical settings.[14] Similar numbers were reported by LGBT (lesbian, gay, bisexual, and transgender) parents seeking care for their children. [15]

Stigma can be defined as a set of negative beliefs about a group of people, and may result in discriminatory behavior. Physicians' stigma has long been established as a factor that can affect patient care, and even reduce the intention to treat. [16 17] Still, few studies to date have assessed physicians' attitudes toward TGNC, and

paediatricians' attitudes have not been reported.

We sought to describe paediatricians' attitudes toward transgender people, and to assess whether certain demographic and occupational characteristics of paediatricians are associated with more negative perceptions. Based on prior research, we hypothesized that women, physicians born in trans-respect countries, those who did not identify as religious, and resident physicians would have higher scores. (Fig. 1, conceptual model).

Methods

Study design and participants

In a cross-sectional survey, paediatricians were approached randomly at two semi-annual paediatric assemblies, at seven hospitals, and in five community clinics in Israel. At all locations, paediatrician identity was verified using a nametag or employee card, and the last four digits of the national personal identify number were recorded to avoid duplications. Consent was obtained; participation was elective, and anonymous.

A total of 391 physicians were approached between July 2017 and July 2018. After data-screening, 368 participated, the final study cohort comprised 355 paediatricians, as 13 failed to fill the full questionnaire. The study was approved by the Helsinki committee of Sheba Medical Center. This research did not receive grants from any funding agency in the public, commercial or not-for-profit sectors.

Patient and Public Involvement.

Patients and public were not involved in this study. Only paediatricians participated in the study, and its results were presented in the annual paediatricians' meeting in Israel.

Materials

The previously validated "Transgender Attitudes and Belief Scale" (TABS) questionnaire was chosen as the instrument for this study.[18] TABS has demonstrated particular ability in capturing attitudes to transgender, compared to other scales that have been administered to medical personnel.[19] Detailed information about validation of the questionnaire has been reported elsewhere. [18] TABS consists of 29 items in three domains: 1) "Human values" domain (5 items), which assesses an individual's inherent value, for example: "Transgender individuals are valuable human beings regardless of how I feel about transgenderism". 2) "Interpersonal comfort" domain (14 items), which measures the respondent's level of comfort in daily interactions with transgender people, for example "If I were introduced to a transgender person at a party, I would feel comfortable having a polite conversation with that person". 3) Sex and gender beliefs domain (10 items), which assesses underlying beliefs in regard to gender, for example: "A person who is not sure about being a man or woman is mentally ill".

Responses on TABS were rated on a seven-point Likert scale for each item, and ranged between 1 "strongly disagree" and 7 "strongly agree". To minimize bias, the questionnaire includes a mix of positively and negatively stated items; negatively stated items were coded as "R", and their scores were later analyzed in reverse. Higher scores indicate positive perceptions. The possible raw ranges of each of the domains of the questionnaire are 5 to 35 for Human values, 14 to 98 for Interpersonal comfort, and 10 to 70 for Sex and gender beliefs.

The TABS questionnaire was translated according to the guidelines for translating and adapting tests issued by the international test commission (ITC). [20]

In addition to the questionnaire, demographic occupational details were reported by

the participants. The details recorded were: gender ("Man", "Woman" or "Other"); birth country as an open-ended question; religious identification as "Secular" or "Religious"; seniority as "Senior paediatrician" (a physician who passed the postgraduate examinations in paediatrics) or "Resident" (a physician who is under postgraduate training in the field of paediatrics), and the location of their primary practice as "Community clinic" or "Hospital (for senior physicians only).

Data analysis

According to currently accepted guidelines for analyzing data of Likert-Type Scales, differences between responses should not be assumed to be equidistant. [21] Paediatricians' answers, given on a seven-point Likert scale, were collapsed into two categories; an equivalent of mean ≥6 for a specific domain was considered a favourable perception. Lower scores (<6) were categorized as "Unfavourable". Paediatrician origin was categorized according to "Trans-respect" versus "Trans-phobic" birth country, to assess the effect of cultural background on perceptions. The categorization was delineated in the updated “Legal and Social Map” issued by the organization, Transgender Europe (TGEU), and is based on political processes, and legal and social practices that concern transgender. [22] For example, the US, most European countries and Israel are considered as "Trans-respecting" because of legal recognition for gender change, anti-discrimination legislation, and trans-specific health care services.

Statistical analyses

Statistical analyses were performed using SAS version 9.4 (SAS Institute Inc., Cary, NC). Descriptive statistics are presented as numbers (percentages) and the median and IQR values. Univariate analysis was used to determine relations between demographic groups and scales scores. The scales were analyzed both as a continuous score and according to dichotomous categories: Interpersonal comfort (below 84, greater or equal to 84), Sex and gender beliefs (below 60, greater or equal to 60), Human value (below 30, greater or equal to 30). Scores using the continuous scales did not follow a normal distribution and therefore were reported by median and interquartile ranges, and compared using the two sample Wilcoxon test or Kruskal Wallis test according to the number of groups compared. Categorical variables were reported by their relative frequencies and compared by the Pearson Chi-Square test. When results of the overall test were statistically significant, pairwise comparisons were performed. The Bonferroni method for adjustment of significance level was used. Spearman coefficients were calculated to examine associations between the scales.

Multivariate logistic regressions were applied to the data to identify the significant independent predictors of the below-threshold values of each of the three scales. The predictors in each regression were sex, secular (yes vs. no), seniority (yes vs. no) and birthplace. A p value of 0.05 was considered significant.

Results

The study cohort comprised 355 paediatricians, 221 (62%) women, 133 (37%) men and 2 "others"; 290 (82%) were born in "trans-respect" countries, 274 (77%) defined themselves as secular, 132 (37%) were residents. Of the 223 (63%) senior

paediatricians, 124 (56%) worked mainly in hospitals, and 102 (44%) mainly in community practice clinics. The median age of the participants was 40 years [IQR 33:54].

Cronbach's alpha for the Humanity subscale was 0.89, for the Sex and gender beliefs subscale 0.87 and for Interpersonal comfort 0.92. These values indicate excellent internal consistency in all subscales. For each of the three domains (Human value, Interpersonal comfort and Sex/gender beliefs), scores were significantly higher for women than men, for secular than religious, and for respondents born in trans-respect compared to transphobic countries (Table 1). For the domain of Interpersonal comfort, but not for the other two domains, residents scored significantly higher than senior physicians.

Overall, 90% of the paediatricians scored favourably (mean score ≥6) on the Human values domain, 68% on the Interpersonal comfort domain, and only 40% on the Sex/gender beliefs domain.

Subsequent analysis characterized the paediatricians who scored unfavourably (Table 2). The characteristics that were found statistically significant on univariate analysis, and were subsequently included in the multivariate model were: being a man, "transphobic" birthplace, religious identification and being a senior physician. These all increased the odds ratio (OR) for an unfavourable score, for both the Interpersonal comfort domain and the Sex\gender beliefs domain). These trends were also observed among the senior physicians, between those working in the community and those working in hospitals. Since only 10% held "unfavourable" attitudes regarding the Human values domain, further analysis was not done regarding this scale.

In the multivariate analysis (Table 3, Figure 2 a-d) of the Interpersonal comfort domain, ORs for an unfavourable response were 2.1 (95% CI 1.3-3.4) for men vs.

women, 3.4 (95% CI 1.9-6.3) for respondents born in transphobic vs. trans-respect countries, 2.4 (95% CI 1.4-4.2) for religious vs secular identification, and 1.8 (95% CI 1.1-3.0) for senior vs. resident paediatricians. In a sub-analysis of senior paediatricians, no statistically significant difference was found between those working primarily in the community versus hospitals; the OR of an unfavourable response was 1.7 (95% CI 0.97-3.14) for mainly community vs. mainly hospital paediatricians.

For the sex and gender beliefs domain, the OR for an unfavourable response was 2.2 (95% CI 1.3-3.5) for men vs. women, 1.7 (95% CI 0.9-3.3) for being born in a transphobic vs. trans-respect country, 10.6 (95% CI 4.7-24.1) for religious vs secular paediatricians, and 1.5 (95% CI 0.9-2.4) for senior vs resident paediatricians. In a sub-analysis of senior paediatricians, no significant difference was found; the OR of an unfavourable response was 1.4 (95% CI 0.7-2.6) for those working mainly in the community vs mainly in the hospital.

Discussion

In this study of attitudes toward transgender people, 90% of paediatricians acknowledged the universal human value of transgender people, yet only two-thirds reported that they would feel comfortable interacting with transgender people, and most paediatricians displayed negative underlying sex/gender beliefs in regard to transgender. Additionally, certain characteristics of the respondents significantly increased the probability of having unfavourable perceptions: being a man, birthplace in a transphobic country, religious identification and being a senior physician rather than a resident physician increased the probability of not feeling “Interpersonal

comfort" in relation to transgender people. Being a man and religious identification increased the probability of having negative sex and gender beliefs.

We presume that the interpersonal comfort domain in the context of this study reflects interactions during medical encounters behind closed doors. Considerable previous works assessed interactions from a transgender point of view,[14 23] or by LGBT parents, [15] and thus provide indirect measurements of physicians' degree of comfort. Our work is the first to directly assess the paediatricians' degree of comfort and may explain results of previous indirect findings.

The sex/gender beliefs domain of the TABS reflects convictions that are held to be true without empirical evidence. Sixty-percent of the paediatricians in the current study expressed stigma regarding gender fluidity, despite the fact that only one-third reported they would feel interpersonal discomfort. This is an important distinction and may result in oblivious discrimination against transgender children.

Among paediatricians, the odds ratio for men to feel less at ease when interacting with transgender persons, and for having negative gender beliefs was two-fold higher than for women. These findings corroborate data of a previous study of paediatricians that showed that women engage in significantly more active partnership behaviors, positive talk, psychosocial counseling, psychosocial question-asking and emotionally focused talk than do male physicians. [24] It has also been suggested that men are more invested than women in adhering to gender norms, because they serve to affirm their own masculinity.[25 26]

Paediatricians born in "transphobic" rather than "trans-respect" countries expressed less comfort in interacting with transgender people. Although we did not assess the number of years since immigration to Israel, data suggest that immigrants tend to

retain certain patterns of their old culture, if only in part, due to a desire to preserve their former identity, and the need for a sense of continuity. However, an important finding of this study is that unfavourable sex/gender beliefs were high in "transphobic" and in "trans-respect" groups, with no significant difference. While research has shown that contact and exposure in a variety of cultural dimensions positively correlates with more favourable attitudes towards a person with whom contact is made, [27] our data suggest that educational programs are needed irrespective of place of birth.

Religiosity, defined by self-identification, was associated with a twofold increased risk of being uncomfortable with transgender people, and a tenfold increased risk of having stigmatizing gender beliefs. This concurs with previous studies that showed a lack of openness toward gender fluidity among religious physicians and health care staff. [28-30] Most religions still hold traditional fixed beliefs in regard to gender. Other studies reported correlations of increased religiosity with more negative attitudes toward transgender persons. [31-33] A systematic review reported evidence of a consistent association of self-religious identification with more negative attitudes toward transgender people and higher levels of transphobia.[34]

Senior physicians expressed greater feelings of discomfort with transgender people than did residents. However, similar to the characteristic of cultural background, unfavourable sex/gender beliefs were high in both groups according to seniority, with no statistically significant difference between them. Previous studies revealed conflicting results regarding a correlation between younger age and more favourable attitudes. The "generational replacement" hypothesis suggests that attitudes change due to younger generations growing up in a more open and accepting atmosphere; and that this, together with generation replacement, is a core tenet in attitude change.[35

36] Accordingly, resident physicians in the US, in contrast with senior physicians, showed more tolerant attitudes regarding various issues, such as substance abuse.[37] However, the findings of the current study suggest that negative sex/gender beliefs are more persistent than feelings of discomfort in interrelating with transgender persons.

While paediatricians working in hospitals are exposed to an academic environment characterized by openness and progress, they did not express greater comfort in dealing with transgender encounters, and did not show less stigmatization, compared with paediatricians in the community. This finding concurs with a study that concluded that the effectiveness of educational programmes may depend not only on increasing informational knowledge, but also on addressing providers' biases; and that educational initiatives should consider the backgrounds of the participants, with the aim of directly addressing prejudice and enhancing cultural humility.[38]

Discrimination by medical providers has been reported by transgender and gender non-conforming people. In a survey of 6,450 in the US, 24% proclaimed they were denied equal treatment in doctors' offices and hospitals, and 28% reported verbal harassment in a doctor's office, emergency room or other medical setting.[39] The greatest barriers to healthcare reported by transgender individuals were lack of providers who are sufficiently knowledgeable on the topic, discrimination and lack of cultural competence by providers.[40] Due to discrimination and disrespect, 28% of adults who identified as transgender persons postponed or avoided medical treatment when they were sick or injured and 33% delayed or did not seek preventive health care.[41]

Transgender children are an especially vulnerable population that is still subject to many barriers. Nonetheless, only a limited number of studies investigated perceived barriers to care among transgender children and adolescents. Transgender youth aged 14- 22 years, described judgmental and hostile clinical interactions, inadequate knowledge and the use of outdated offensive language that detracted from providers' ability to deliver gender-affirming care.[42] While several studies investigated attitudes of caregivers such as psychiatrists,[43] perinatal care providers,[44] providers of pharmaceutical care,[45] emergency medicine residents[46] and oncologists,[47] we did not find studies assessing attitudes of paediatricians.

Paediatricians are generally the first healthcare worker to see transgender children and their parents and families. Thus, paediatricians have the opportunity to create a safe environment, and to be attentive to the needs of children who seek reassurance and education regarding their gender identity. Furthermore, paediatricians are responsible for referring transgender children to puberty suppression, which was demonstrated to reduce the risk of emotional and behavioral problems and to increase functioning.[6] A medical provider lacking the sensitivity and cultural competence to engage a transgender patient, especially a teenager, may miss signs of gender dysphoria and potentially cause harm by saying gender stereotypical things that alienate the patient further.[48] Indeed, physicians' stigma has long been established as a factor that can affect the provision of care, and even reduce the intention to treat.[49 50]. The negative attitudes among paediatricians reported in the current study may affect care. However, elsewhere, such attitudes were shown to be modifiable, using anti-stigma programming, [51] as has been done with mental illness and HIV.[52-55] Targeted contact-based interventions have demonstrated particular effectiveness.[56 57]

This study has some limitations. We used a convenience sample, which raises the possibility of selection bias, as characteristics may have differed between those who agreed and did not agree to participate, or to complete the survey. However, only 6% of those approached did not complete the survey, and only 3.5% of those who started the survey did not complete it. Moreover, we would expect that those who completed the survey might have more positive attitudes than those who did not. Negative beliefs may have a complex impact on behavior, and we only assessed interpersonal comfort; this could portray an oversimplified picture. The lack of information regarding prior medical training and educational exposure of the survey participants is a limitation of this study. In addition, we studied birth country but did not assess the number of years since immigration to Israel. Nevertheless, immigrants tend to retain certain patterns of their old culture, due to a desire to preserve their former identity, if only in part, and the need for a sense of continuity. We set a high standard for favorable attitudes; our cutoff required at least six on a seven-point Likert scale. The strengths of this study are the large sample of paediatricians with a high response rate, the use of a previously validated instrument, and analysis by characteristics of the respondents

In summary, an overwhelming majority of paediatricians acknowledged that transgender people should be treated according to basic human values, and most felt they could interact comfortably with transgender people. Nonetheless, the majority of respondents reported negative beliefs regarding transgender people, thus indicating that stigmatization and prejudice still exist, even among paediatricians. As physicians' attitudes can affect patient management, and in light of the great importance of proper care by paediatricians for transgender and gender non-conforming children and youth, interventions to improve beliefs are warranted.

Legends

Table 1. Median values and ranges of scores on the Transgender Attitudes and Beliefs Scale, according to characteristics of the respondents.

Table 2. Responses of paediatricians to two domains of the Transgender Attitudes and Beliefs Scale, according to demographic characteristics.

Table 3 - Multivariate analysis of an overall unfavourable (<6) vs. favourable (≥6) response on two domains of the Transgender Attitudes and Beliefs score, according to characteristics of the respondents.

Figure 1. Conceptual model of hypothesized relationships between the outcome and predictor variables. This model, based on the literature, was used in construction of the regression models. We hypothesized that women, physicians born in trans-respect countries, those who did not identify as religious, and resident physicians would have higher scores in all domains. A hierarchically arranged continuum was observed in which all the variables examined were associated with high scores of Human values, and lower scores on Interpersonal comfort. Regarding the Beliefs domain, no differences were observed between resident and senior physicians, and between those working in academic vs non-academic set-ups. Males, individuals who identified as being religious, and those born in transphobic countries had higher odds ratios. Due to the cross-sectional design of the study, causality cannot be inferred from the results.

Figure 2: Multivariate analysis of an overall unfavourable (<6) vs. favourable (≥6) response on two domains of the Transgender Attitudes and Beliefs score, according to characteristics of the respondents

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Table 1. Median values and ranges of scores on the Transgender Attitudes and Beliefs Scale, according to characteristics of the respondents.

Characteristics	N (%)	Human Value (5-35)	Interpersonal Comfort (14-98)	Sex / Gender Beliefs (10-70)	Human Value (5-35)
All	355 (100)	35 (34, 35)	86 (75,94)	57 (46,64)	35 (34, 35)
Gender					
Women	221 (63)	35 (35,35)	89 (78,95)	59 (50,64)	35 (35,35)
Men	132 (37)	35 (31,35)	82 (64,92)	53 (42,61)	35 (31,35)
p		<0.001	<0.001	<0.001	<0.001
Religiosity					
Secular	274 (77)	35 (35, 35)	89 (77, 95)	59 (52, 64)	35 (35, 35)
Religious	81(23)	35 (30, 35)	80 (59, 88)	44 (33, 53)	35 (30, 35)
p		<0.001	<0.001	<0.001	<0.001
Birth country**					
Trans-respect	290 (82)	35 (35, 35)	88 (78, 95)	58 (49,64)	35 (35, 35)
Transphobic	65 (18)	34 (29, 35)	76 (60, 87)	48 (40, 61)	34 (29, 35)
p		<0.001	<0.001	<0.001	<0.001
Experience					
Senior physician	223 (63)	35 (33,35)	84 (71,93)	56 (45,63)	35 (33,35)
Resident	132 (37)	35 (35,35)	90 (80,95)	58 (47,64)	35 (35,35)
p		0.037	0.001	0.13	0.037

**The categories of "Trans-respect" versus "Trans-phobic" are based on political processes, and legal and social practices that concern transgender.

Table 2. Responses of pediatricians to two domains of the Transgender Attitudes and Beliefs Scale, according to demographic characteristics. Responses of ≥6 on a 7-point Likert scale were considered "Favourable". Responses of <6 were considered "Unfavourable".

	Interpersonal comfort N (%)		**Sex \ gender beliefs N (%)**	
Variable	**Unfavourable (N=150)**	**Favourable (N=205)**	**Unfavourable (213)**	**Favourable (N=142)**
Gender				
Women n=221	76 (34%)	145 (66%)	117 (53%)	104 (47%)
Men n=132	73 (55%)	59 (45%)	95 (72%)	37 (28%)
p	<0.001		<0.001	
Birth country				
Trans-respect n=290	106 (37%)	184 (63%)	167 (58%)	123 (32%)
Transphobic n=65	43 (66%)	21 (44%)	46 (71%)	19 (29%)
p	<0.001		0.06	
Religiosity				
Secular n=274	103 (38%)	171 (62%)	139 (51%)	135 (49%)
Religious n=81	47 (58%)	34 (42%)	74 (91%)	7 (9%)
p	0.001		<0.001	
Experience				
Residents (n=132)	40 (30%)	92 (70%)	69 (52%)	63 (48%)
Seniors (n=223)	110 (49%)	113 (51%)	144(65%)	79 (35%)
p	<0.001		0.022	
	Unfavourable (N=106)	**Favourable (N=113)**	**Unfavourable (141)**	**Favourable (N=78)**
Location of primary practice for senior paediatricians (n=219)				
Hospital (n=124)	50 (40%)	74 (60%)	75 (60%)	49 (40%)
Community (n=95)	56 (59%)	39 (41%)	66 (69%)	29 (31%)
p	<0.01		0.17	

Table 3 – Multivariate analysis of an overall unfavourable (<6) vs. favourable (≥6) response on two domains of the Transgender Attitudes and Beliefs score, according to characteristics of the respondents

	Interpersonal comfort		**Sex /gender beliefs**	
Effect	Odds ratio (95% CI)	p	Odds ratio (95% CI)	p
Gender				
Men	2.1 (1.3-3.4)	0.0013	2.2 (1.3-3.5)	0.0032
Women	1		1	
Birth place				
Transphobic	3.4 (1.9-6.3)	<0.0001	1.7 (0.9-3.3)	0.0837
Trans-respect	1		1	
Religiosity				
Religious	2.4 (1.4-4.2)	0.0011	10.6 (4.7-24.1)	<0.0001
Secular	1		1	
Seniority				0.1331
Senior	1.8 (1.1-3.0)	0.0139	1.5 (0.9-2.4)	
Resident	1			

* Adjusted for gender, age, birth country, religiosity, and experience.

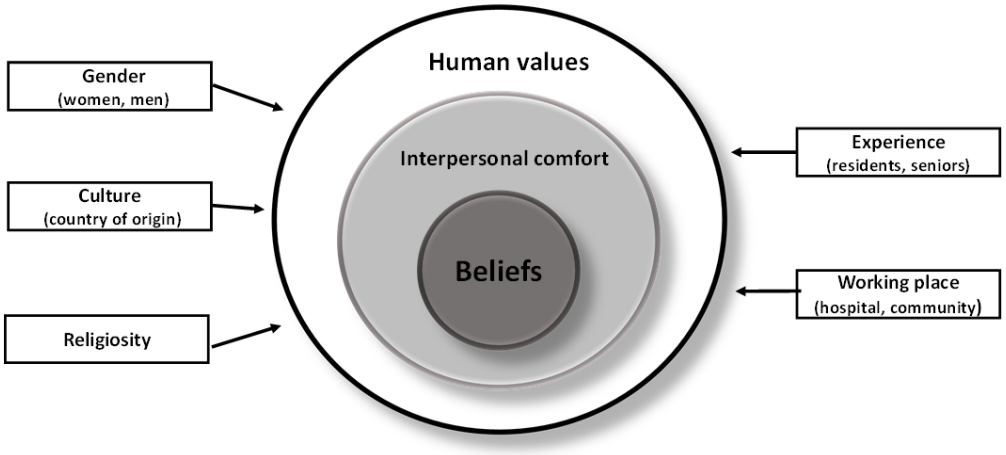

Figure 1. Conceptual model of hypothesized relationships between the outcome and predictor variables. This model, based on the literature, was used in construction of the regression models. We hypothesized that women, physicians born in trans-respect countries, those who did not identify as religious, and resident physicians would have higher scores in all domains. A hierarchically arranged continuum was observed in which all the variables examined were associated with high scores of Human values, and lower scores on Interpersonal comfort. Regarding the Beliefs domain, no differences were observed between resident and senior physicians, and between those working in academic vs non-academic set-ups. Males, individuals who identified as being religious, and those born in transphobic countries had higher odds ratios. Due to the cross-sectional design of the study, causality cannot be inferred from the results.

90x90mm (300 x 300 DPI)

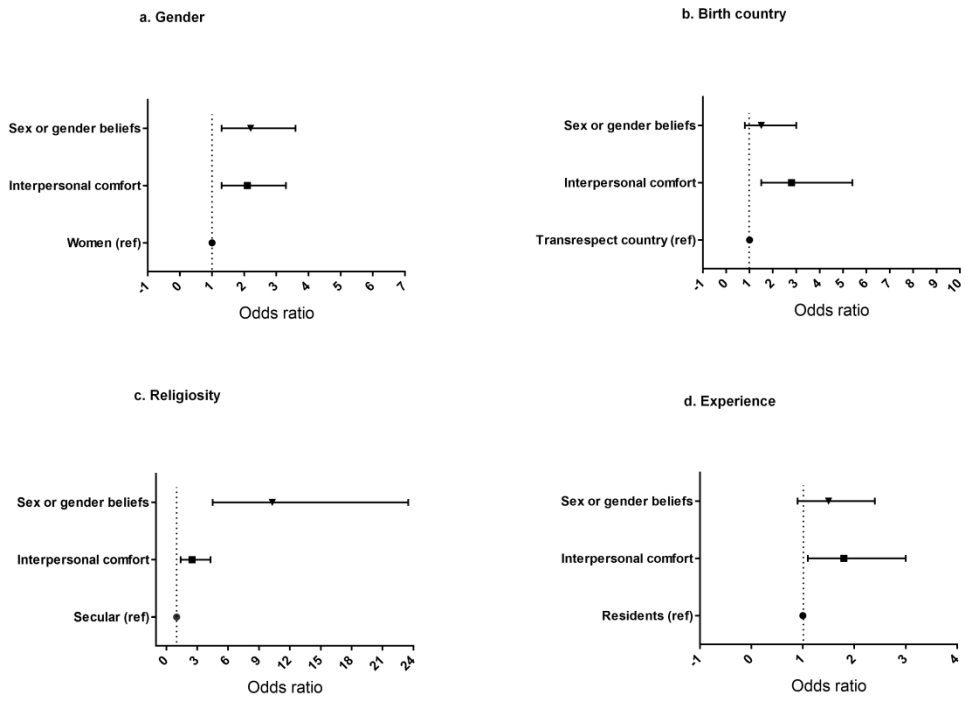

Figure 2: Multivariate analysis of an overall unfavourable (<6) vs. favourable (≥6) response on two domains of the Transgender Attitudes and Beliefs score, according to characteristics of the respondents

349x246mm (300 x 300 DPI)

STROBE Statement—Checklist of items that should be included in reports of ***cohort studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	5
		(*b*) For matched studies, give matching criteria and number of exposed and unexposed	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6
Bias	9	Describe any efforts to address potential sources of bias	
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	7
		(*c*) Explain how missing data were addressed	7
		(*d*) If applicable, explain how loss to follow-up was addressed	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7
		(b) Give reasons for non-participation at each stage- not relevant	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	7
		(b) Indicate number of participants with missing data for each variable of interest	
		(c) Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	Report numbers of outcome events or summary measures over time	

Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included (*b*) Report category boundaries when continuous variables were categorized (*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	8
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	9
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10
Generalisability	21	Discuss the generalisability (external validity) of the study results	12
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Not relevant

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.

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Paediatricians' Attitudes and Beliefs toward Transgender People- A Cross-Sectional Survey in Israel

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Paediatricians' Attitudes and Beliefs toward Transgender People- A Cross-Sectional Survey in Israel

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Abstract

Objective: The number of transgender and gender non-conforming children is on the rise. For these children, the timing of medical intervention is crucial, yet transgender children report poorer overall physical and mental health outcomes compared to their cisgender peers. We aim to describe how paediatricians perceive transgender people.

Setting: The "Transgender Attitudes and Beliefs Scale", which consists of 29 items in three domains: Human value, Interpersonal comfort and Sex/gender beliefs, was administered to 391 senior and resident paediatricians in Israel. The responses, on a seven-point Likert scale were collapsed into two categories; the mean score of ≥6 for each domain was a "Favourable" perception, and <6 "Unfavourable".

Results: Of 355 respondents (91% response rate), 221(62%) were women, 132(37%) men and 2 identified as "other"; 290(82%) were born in "trans-respect countries", 274(77%) identified as secular, 223(63%) were senior physicians and 132(27%) residents. Overall, 90% of the cohort scored favourably on the "Human value" domain, 68% on "Interpersonal comfort" and 40% on "Sex\gender beliefs". In the "Interpersonal comfort" domain: being a man, birthplace in a transphobic country, identification as religious, and being a senior physician, were all associated with increased odds ratios (ORs) for an unfavourable score; 2.1(95%CI 1.3-3.4), 3.4(95%CI 1.9-6.3), 2.4(95%CI 1.4-4.2) and 1.8(95%CI 1.1-3.0), respectively. In the "Sex\gender beliefs" domain, being a man and identifying as religious had significantly increased ORs for unfavourable scores, 2.2(95% CI 1.3-3.5) and 10.6(95% CI 4.7-24.1), respectively.

Conclusions: Negative attitudes toward transgender people are still widespread among paediatricians. Interventions are warranted to positively impact these attitudes.

Article summary: Strengths and limitations of this study

1. Paediatricians are key figures in the care of transgender children, yet data are sparse regarding their perceptions of transgender persons, we therefore studied this important issue.

2. The response rate of the paediatricians was high.

3. A previously validated, multidimensional questionnaire was used.

4. A limitation of the study is that variables such as education, knowledge and years since immigration to Israel were not assessed.

Introduction

Transgender is a term used to describe persons whose gender identity does not conform to the one assigned to them at birth. In the past decade, the medical community has turned a spotlight on the paediatric transgender population, in an attempt to remove barriers that may preclude proper care.[1] Paediatricians, who are on the front lines of this revolution, are becoming key figures for transgender and gender non-conforming (TGNC) children and youth. Firstly, accumulating evidence shows that the number of TGNC children is higher than previously thought.[2-4] According to a recent US population based study, 2.7% of teenagers in grades 9-11 self-defined as transgender.[5] These children increasingly seek medical aid or advice from their paediatricians.[1]

Secondly, for the children who seek medical intervention, time is in the essence, as current standard of care "puberty blockers" should be given at the onset of puberty.[6] Studies from the US and the Netherlands demonstrated drastically reduced risk for

added comorbidities following treatment, as well as improved physical and psychological outcomes.[7-9] Thus, it is unfortunate that data also show that most children who were referred for treatment were in fact older than the optimal age for intervention at presentation.[2 10] Moreover, even the establishment of a multidisciplinary gender clinic did not lead to a significant change in the age at presentation.[2]

Finally, transgender children report poorer overall physical and mental health outcomes compared to their cisgender peers, with greater prevalence of depression, anxiety, self-mutilation, substance abuse and suicide attempts. [2 5 11] Yet, psychopathology is not inevitable within this group; transgender children who are supported in their gender identity have been shown to have developmentally normative levels of depression and only minimal elevations in anxiety.[12] As the first medical provider that transgender youth and their families generally encounter, the paediatrician has a critical role in supporting social transition and affirmation, and in coordinating appropriate referrals and follow-up. [13] Recent years have attested to increasing public awareness regarding gender identity. Further, a policy statement issued by the Endocrine Society provides guidance for clinicians according to a gender-affirming approach.[6] Nonetheless, almost one-third of transgender people who responded to the US National Transgender Discrimination Survey reported harassment in medical settings.[14] Similar numbers were reported by LGBT (lesbian, gay, bisexual, and transgender) parents seeking care for their children. [15]

Stigma can be defined as a set of negative beliefs about a group of people, and may result in discriminatory behavior. Physicians' stigma has long been established as a factor that can affect patient care, and even reduce the intention to treat. [16 17] Still, few studies to date have assessed physicians' attitudes toward TGNC, and

paediatricians' attitudes have not been reported.

We sought to describe paediatricians' attitudes toward transgender people, and to assess whether certain demographic and occupational characteristics of paediatricians are associated with more negative perceptions. Based on prior research, we hypothesized that women, physicians born in trans-respect countries, those who did not identify as religious, and resident physicians would have higher scores. (Fig. 1, conceptual model).

Methods

Study design and participants

In a cross-sectional survey, paediatricians were approached randomly at two semi-annual paediatric assemblies, at seven hospitals, and in five community clinics in Israel. At all locations, paediatrician identity was verified using a nametag or employee card, and the last four digits of the national personal identify number were recorded to avoid duplications. Consent was obtained; participation was elective, and anonymous.

A total of 391 physicians were approached between July 2017 and July 2018. After data-screening, 368 participated, the final study cohort comprised 355 paediatricians, as 13 failed to fill the full questionnaire. The study was approved by the Helsinki committee of Sheba Medical Center. This research did not receive grants from any funding agency in the public, commercial or not-for-profit sectors.

Patient and Public Involvement.

Patients and public were not involved in this study. Only paediatricians participated in the study, and its results were presented in the annual paediatricians' meeting in Israel.

Materials

The previously validated "Transgender Attitudes and Belief Scale" (TABS) questionnaire was chosen as the instrument for this study.[18] TABS has demonstrated particular ability in capturing attitudes to transgender, compared to other scales that have been administered to medical personnel.[19] Detailed information about validation of the questionnaire has been reported elsewhere. [18] TABS consists of 29 items in three domains: 1) "Human values" domain (5 items), which assesses an individual's inherent value, for example: "Transgender individuals are valuable human beings regardless of how I feel about transgenderism". 2) "Interpersonal comfort" domain (14 items), which measures the respondent's level of comfort in daily interactions with transgender people, for example "If I were introduced to a transgender person at a party, I would feel comfortable having a polite conversation with that person". 3) Sex and gender beliefs domain (10 items), which assesses underlying beliefs in regard to gender, for example: "A person who is not sure about being a man or woman is mentally ill".

Responses on TABS were rated on a seven-point Likert scale for each item, and ranged between 1 "strongly disagree" and 7 "strongly agree". To minimize bias, the questionnaire includes a mix of positively and negatively stated items; negatively stated items were coded as "R", and their scores were later analyzed in reverse. Higher scores indicate positive perceptions. The possible raw ranges of each of the domains of the questionnaire are 5 to 35 for Human values, 14 to 98 for Interpersonal comfort, and 10 to 70 for Sex and gender beliefs.

The TABS questionnaire was translated according to the guidelines for translating and adapting tests issued by the international test commission (ITC). [20]

In addition to the questionnaire, demographic occupational details were reported by

the participants. The details recorded were: gender ("Man", "Woman" or "Other"); birth country as an open-ended question; religious identification as "Secular" or "Religious"; seniority as "Senior paediatrician" (a physician who passed the postgraduate examinations in paediatrics) or "Resident" (a physician who is under postgraduate training in the field of paediatrics), and the location of their primary practice as "Community clinic" or "Hospital (for senior physicians only).

Data analysis

According to currently accepted guidelines for analyzing data of Likert-Type Scales, differences between responses should not be assumed to be equidistant. [21] Paediatricians' answers, given on a seven-point Likert scale, were collapsed into two categories; an equivalent of mean ≥6 for a specific domain was considered a favourable perception. Lower scores (<6) were categorized as "Unfavourable". Paediatrician origin was categorized according to "Trans-respect" versus "Trans-phobic" birth country, to assess the effect of cultural background on perceptions. The categorization was delineated in the updated “Legal and Social Map” issued by the organization, Transgender Europe (TGEU), and is based on political processes, and legal and social practices that concern transgender. [22] For example, the US, most European countries and Israel are considered as "Trans-respecting" because of legal recognition for gender change, anti-discrimination legislation, and trans-specific health care services.

Statistical analyses

Statistical analyses were performed using SAS version 9.4 (SAS Institute Inc., Cary, NC). Descriptive statistics are presented as numbers (percentages) and the median and IQR values. Univariate analysis was used to determine relations between demographic groups and scales scores. The scales were analyzed both as a continuous score and according to dichotomous categories: Interpersonal comfort (below 84, greater or equal to 84), Sex and gender beliefs (below 60, greater or equal to 60), Human value (below 30, greater or equal to 30). Scores using the continuous scales did not follow a normal distribution and therefore were reported by median and interquartile ranges, and compared using the two sample Wilcoxon test or Kruskal Wallis test according to the number of groups compared. Categorical variables were reported by their relative frequencies and compared by the Pearson Chi-Square test. When results of the overall test were statistically significant, pairwise comparisons were performed. The Bonferroni method for adjustment of significance level was used. Spearman coefficients were calculated to examine associations between the scales.

Multivariate logistic regressions were applied to the data to identify the significant independent predictors of the below-threshold values of each of the three scales. The predictors in each regression were sex, secular (yes vs. no), seniority (yes vs. no) and birthplace. A p value of 0.05 was considered significant.

Results

The study cohort comprised 355 paediatricians, 221 (62%) women, 133 (37%) men and 2 "others"; 290 (82%) were born in "trans-respect" countries, 274 (77%) defined themselves as secular, 132 (37%) were residents. Of the 223 (63%) senior

paediatricians, 124 (56%) worked mainly in hospitals, and 102 (44%) mainly in community practice clinics. The median age of the participants was 40 years [IQR 33:54].

Cronbach's alpha for the Humanity subscale was 0.89, for the Sex and gender beliefs subscale 0.87 and for Interpersonal comfort 0.92. These values indicate excellent internal consistency in all subscales. For each of the three domains (Human value, Interpersonal comfort and Sex/gender beliefs), scores were significantly higher for women than men, for secular than religious, and for respondents born in trans-respect compared to transphobic countries (Table 1). For the domain of Interpersonal comfort, but not for the other two domains, residents scored significantly higher than senior physicians.

Overall, 90% of the paediatricians scored favourably (mean score ≥6) on the Human values domain, 68% on the Interpersonal comfort domain, and only 40% on the Sex/gender beliefs domain.

Subsequent analysis characterized the paediatricians who scored unfavourably (Table 2). The characteristics that were found statistically significant on univariate analysis, and were subsequently included in the multivariate model were: being a man, "transphobic" birthplace, religious identification and being a senior physician. These all increased the odds ratio (OR) for an unfavourable score, for both the Interpersonal comfort domain and the Sex\gender beliefs domain). These trends were also observed among the senior physicians, between those working in the community and those working in hospitals. Since only 10% held "unfavourable" attitudes regarding the Human values domain, further analysis was not done regarding this scale.

In the multivariate analysis (Table 3, Figure 2 a-d) of the Interpersonal comfort domain, ORs for an unfavourable response were 2.1 (95% CI 1.3-3.4) for men vs.

women, 3.4 (95% CI 1.9-6.3) for respondents born in transphobic vs. trans-respect countries, 2.4 (95% CI 1.4-4.2) for religious vs secular identification, and 1.8 (95% CI 1.1-3.0) for senior vs. resident paediatricians. In a sub-analysis of senior paediatricians, no statistically significant difference was found between those working primarily in the community versus hospitals; the OR of an unfavourable response was 1.7 (95% CI 0.97-3.14) for mainly community vs. mainly hospital paediatricians.

For the sex and gender beliefs domain, the OR for an unfavourable response was 2.2 (95% CI 1.3-3.5) for men vs. women, 1.7 (95% CI 0.9-3.3) for being born in a transphobic vs. trans-respect country, 10.6 (95% CI 4.7-24.1) for religious vs secular paediatricians, and 1.5 (95% CI 0.9-2.4) for senior vs resident paediatricians. In a sub-analysis of senior paediatricians, no significant difference was found; the OR of an unfavourable response was 1.4 (95% CI 0.7-2.6) for those working mainly in the community vs mainly in the hospital.

Discussion

In this study of attitudes toward transgender people, 90% of paediatricians acknowledged the universal human value of transgender people, yet only two-thirds reported that they would feel comfortable interacting with transgender people, and most paediatricians displayed negative underlying sex/gender beliefs in regard to transgender. Additionally, certain characteristics of the respondents significantly increased the probability of having unfavourable perceptions: being a man, birthplace in a transphobic country, religious identification and being a senior physician rather than a resident physician increased the probability of not feeling “Interpersonal

comfort" in relation to transgender people. Being a man and religious identification increased the probability of having negative sex and gender beliefs.

We presume that the interpersonal comfort domain in the context of this study reflects interactions during medical encounters behind closed doors. Considerable previous works assessed interactions from a transgender point of view,[14 23] or by LGBT parents, [15] and thus provide indirect measurements of physicians' degree of comfort. Our work is the first to directly assess the paediatricians' degree of comfort and may explain results of previous indirect findings.

The sex/gender beliefs domain of the TABS reflects convictions that are held to be true without empirical evidence. Sixty-percent of the paediatricians in the current study expressed stigma regarding gender fluidity, despite the fact that only one-third reported they would feel interpersonal discomfort. This is an important distinction and may result in oblivious discrimination against transgender children.

Among paediatricians, the odds ratio for men to feel less at ease when interacting with transgender persons, and for having negative gender beliefs was two-fold higher than for women. These findings corroborate data of a previous study of paediatricians that showed that women engage in significantly more active partnership behaviors, positive talk, psychosocial counseling, psychosocial question-asking and emotionally focused talk than do male physicians. [24] It has also been suggested that men are more invested than women in adhering to gender norms, because they serve to affirm their own masculinity.[25 26]

Paediatricians born in "transphobic" rather than "trans-respect" countries expressed less comfort in interacting with transgender people. Although we did not assess the number of years since immigration to Israel, data suggest that immigrants tend to

retain certain patterns of their old culture, if only in part, due to a desire to preserve their former identity, and the need for a sense of continuity. However, an important finding of this study is that unfavourable sex/gender beliefs were high in "transphobic" and in "trans-respect" groups, with no significant difference. While research has shown that contact and exposure in a variety of cultural dimensions positively correlates with more favourable attitudes towards a person with whom contact is made, [27] our data suggest that educational programs are needed irrespective of place of birth.

Religiosity, defined by self-identification, was associated with a twofold increased risk of being uncomfortable with transgender people, and a tenfold increased risk of having stigmatizing gender beliefs. This concurs with previous studies that showed a lack of openness toward gender fluidity among religious physicians and health care staff. [28-30] Most religions still hold traditional fixed beliefs in regard to gender. Other studies reported correlations of increased religiosity with more negative attitudes toward transgender persons. [31-33] A systematic review reported evidence of a consistent association of self-religious identification with more negative attitudes toward transgender people and higher levels of transphobia.[34]

Senior physicians expressed greater feelings of discomfort with transgender people than did residents. However, similar to the characteristic of cultural background, unfavourable sex/gender beliefs were high in both groups according to seniority, with no statistically significant difference between them. Previous studies revealed conflicting results regarding a correlation between younger age and more favourable attitudes. The "generational replacement" hypothesis suggests that attitudes change due to younger generations growing up in a more open and accepting atmosphere; and that this, together with generation replacement, is a core tenet in attitude change.[35

36] Accordingly, resident physicians in the US, in contrast with senior physicians, showed more tolerant attitudes regarding various issues, such as substance abuse.[37] However, the findings of the current study suggest that negative sex/gender beliefs are more persistent than feelings of discomfort in interrelating with transgender persons.

While paediatricians working in hospitals are exposed to an academic environment characterized by openness and progress, they did not express greater comfort in dealing with transgender encounters, and did not show less stigmatization, compared with paediatricians in the community. This finding concurs with a study that concluded that the effectiveness of educational programmes may depend not only on increasing informational knowledge, but also on addressing providers' biases; and that educational initiatives should consider the backgrounds of the participants, with the aim of directly addressing prejudice and enhancing cultural humility.[38]

While one-third of all transgender individuals who had seen a health care professional in the past year reported being harassed or denied care, less is known about transgender care from the physician's perspective. Among primary care clinicians and gynaecologic health care providers, 15-30% expressed not feeling capable of providing care to transgender patients. [39 40] This is the first study among paediatricians. Discrimination by medical providers has been reported by transgender and gender non-conforming people. In a survey of 6,450 in the US, 24% proclaimed they were denied equal treatment in doctors' offices and hospitals, and 28% reported verbal harassment in a doctor's office, emergency room or other medical setting.[41] The greatest barriers to healthcare reported by transgender individuals were lack of providers who are sufficiently knowledgeable on the topic, discrimination and lack of cultural competence by providers.[42] Due to discrimination and disrespect, 28% of

adults who identified as transgender persons postponed or avoided medical treatment when they were sick or injured and 33% delayed or did not seek preventive health care.[43]

Transgender children are an especially vulnerable population that is still subject to many barriers. Nonetheless, only a limited number of studies investigated perceived barriers to care among transgender children and adolescents. Transgender youth aged 14- 22 years, described judgmental and hostile clinical interactions, inadequate knowledge and the use of outdated offensive language that detracted from providers' ability to deliver gender-affirming care.[44] While several studies investigated attitudes of caregivers such as psychiatrists,[45] perinatal care providers,[46] providers of pharmaceutical care,[47] emergency medicine residents[48] and oncologists,[49] we did not find studies assessing attitudes of paediatricians.

Paediatricians are generally the first healthcare worker to see transgender children and their parents and families. Thus, paediatricians have the opportunity to create a safe environment, and to be attentive to the needs of children who seek reassurance and education regarding their gender identity. Furthermore, paediatricians are responsible for referring transgender children to puberty suppression, which was demonstrated to reduce the risk of emotional and behavioral problems and to increase functioning.[6] A medical provider lacking the sensitivity and cultural competence to engage a transgender patient, especially a teenager, may miss signs of gender dysphoria and potentially cause harm by saying gender stereotypical things that alienate the patient further.[50] Indeed, physicians' stigma has long been established as a factor that can affect the provision of care, and even reduce the intention to treat.[51 52]. The negative attitudes among paediatricians reported in the current study may affect care.

However, elsewhere, such attitudes were shown to be modifiable, using anti-stigma programming, [53] as has been done with mental illness and HIV.[54-57] Targeted contact-based interventions have demonstrated particular effectiveness.[58 59]

This study has some limitations. We used a convenience sample, which raises the possibility of selection bias, as characteristics may have differed between those who agreed and did not agree to participate, or to complete the survey. However, only 6% of those approached did not complete the survey, and only 3.5% of those who started the survey did not complete it. Moreover, we would expect that those who completed the survey might have more positive attitudes than those who did not. The TABS questionnaire examines attitudes to 'transgender people' in general, and therefore does not necessarily reflect attitudes to transgender children. Negative beliefs may have a complex impact on behavior, and we only assessed interpersonal comfort; this could portray an oversimplified picture. The lack of information regarding prior medical training and educational exposure of the survey participants is a limitation of this study. In addition, we studied birth country but did not assess the number of years since immigration to Israel. Nevertheless, immigrants tend to retain certain patterns of their old culture, due to a desire to preserve their former identity, if only in part, and the need for a sense of continuity. We set a high standard for favorable attitudes; our cutoff required at least six on a seven-point Likert scale. The strengths of this study are the large sample of paediatricians with a high response rate, the use of a previously validated instrument, and analysis by characteristics of the respondents

In summary, an overwhelming majority of paediatricians acknowledged that transgender people should be treated according to basic human values, and most felt they could interact comfortably with transgender people. Nonetheless, the majority of respondents reported negative beliefs regarding transgender people, thus indicating

that stigmatization and prejudice still exist, even among paediatricians. As physicians' attitudes can affect patient management, and in light of the great importance of proper care by paediatricians for transgender and gender non-conforming children and youth, interventions to improve beliefs are warranted.

Legends

Table 1. Median values and ranges of scores on the Transgender Attitudes and Beliefs Scale, according to characteristics of the respondents.

Table 2. Responses of paediatricians to two domains of the Transgender Attitudes and Beliefs Scale, according to demographic characteristics.

Table 3 - Multivariate analysis of an overall unfavourable (<6) vs. favourable (≥6) response on two domains of the Transgender Attitudes and Beliefs score, according to characteristics of the respondents.

Figure 1. Conceptual model of hypothesized relationships between the outcome and predictor variables. This model, based on the literature, was used in construction of the regression models. We hypothesized that women, physicians born in trans-respect countries, those who did not identify as religious, and resident physicians would have higher scores in all domains. A hierarchically arranged continuum was observed in which all the variables examined were associated with high scores of Human values, and lower scores on Interpersonal comfort. Regarding the Beliefs domain, no differences were observed between resident and senior physicians, and between those working in academic vs non-academic set-ups. Males, individuals who identified as being religious, and those born in transphobic countries had higher odds ratios. Due to the cross-sectional design of the study, causality cannot be inferred from the results.

Figure 2: Multivariate analysis of an overall unfavourable (<6) vs. favourable (≥6) response on two domains of the Transgender Attitudes and Beliefs score, according to characteristics of the respondents

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Table 1. Median values and ranges of scores on the Transgender Attitudes and Beliefs Scale, according to characteristics of the respondents.

Characteristics	N (%)	Human Value (5-35)	Interpersonal Comfort (14-98)	Sex / Gender Beliefs (10-70)	Human Value (5-35)
All	355 (100)	35 (34, 35)	86 (75,94)	57 (46,64)	35 (34, 35)
Gender					
Women	221 (63)	35 (35,35)	89 (78,95)	59 (50,64)	35 (35,35)
Men	132 (37)	35 (31,35)	82 (64,92)	53 (42,61)	35 (31,35)
p		<0.001	<0.001	<0.001	<0.001
Religiosity					
Secular	274 (77)	35 (35, 35)	89 (77, 95)	59 (52, 64)	35 (35, 35)
Religious	81(23)	35 (30, 35)	80 (59, 88)	44 (33, 53)	35 (30, 35)
p		<0.001	<0.001	<0.001	<0.001
Birth country**					
Trans-respect	290 (82)	35 (35, 35)	88 (78, 95)	58 (49,64)	35 (35, 35)
Transphobic	65 (18)	34 (29, 35)	76 (60, 87)	48 (40, 61)	34 (29, 35)
p		<0.001	<0.001	<0.001	<0.001
Experience					
Senior physician	223 (63)	35 (33,35)	84 (71,93)	56 (45,63)	35 (33,35)
Resident	132 (37)	35 (35,35)	90 (80,95)	58 (47,64)	35 (35,35)
p		0.037	0.001	0.13	0.037

**The categories of "Trans-respect" versus "Trans-phobic" are based on political processes, and legal and social practices that concern transgender.

Table 2. Responses of pediatricians to two domains of the Transgender Attitudes and Beliefs Scale, according to demographic characteristics. Responses of ≥6 on a 7-point Likert scale were considered "Favourable". Responses of <6 were considered "Unfavourable".

	Interpersonal comfort N (%)		Sex \ gender beliefs N (%)	
Variable	**Unfavourable (N=150)**	**Favourable (N=205)**	**Unfavourable (213)**	**Favourable (N=142)**
Gender				
Women n=221	76 (34%)	145 (66%)	117 (53%)	104 (47%)
Men n=132	73 (55%)	59 (45%)	95 (72%)	37 (28%)
p	<0.001		<0.001	
Birth country				
Trans-respect n=290	106 (37%)	184 (63%)	167 (58%)	123 (32%)
Transphobic n=65	43 (66%)	21 (44%)	46 (71%)	19 (29%)
p	<0.001		0.06	
Religiosity				
Secular n=274	103 (38%)	171 (62%)	139 (51%)	135 (49%)
Religious n=81	47 (58%)	34 (42%)	74 (91%)	7 (9%)
p	0.001		<0.001	
Experience				
Residents (n=132)	40 (30%)	92 (70%)	69 (52%)	63 (48%)
Seniors (n=223)	110 (49%)	113 (51%)	144(65%)	79 (35%)
p	<0.001		0.022	
	Unfavourable (N=106)	**Favourable (N=113)**	**Unfavourable (141)**	**Favourable (N=78)**
Location of primary practice for senior paediatricians (n=219)				
Hospital (n=124)	50 (40%)	74 (60%)	75 (60%)	49 (40%)
Community (n=95)	56 (59%)	39 (41%)	66 (69%)	29 (31%)
p	<0.01		0.17	

Table 3 – Multivariate analysis of an overall unfavourable (<6) vs. favourable (≥6) response on two domains of the Transgender Attitudes and Beliefs score, according to characteristics of the respondents

	Interpersonal comfort		**Sex /gender beliefs**	
Effect	Odds ratio (95% CI)	p	Odds ratio (95% CI)	p
Gender				
Men	2.1 (1.3-3.4)	0.0013	2.2 (1.3-3.5)	0.0032
Women	1		1	
Birth place				
Transphobic	3.4 (1.9-6.3)	<0.0001	1.7 (0.9-3.3)	0.0837
Trans-respect	1		1	
Religiosity				
Religious	2.4 (1.4-4.2)	0.0011	10.6 (4.7-24.1)	<0.0001
Secular	1		1	
Seniority				0.1331
Senior	1.8 (1.1-3.0)	0.0139	1.5 (0.9-2.4)	
Resident	1			

* Adjusted for gender, age, birth country, religiosity, and experience.

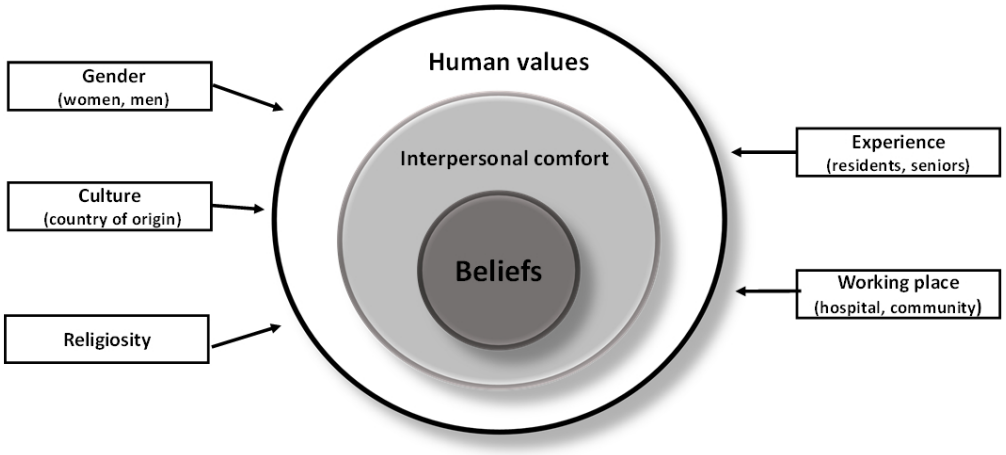

Figure 1. Conceptual model of hypothesized relationships between the outcome and predictor variables. This model, based on the literature, was used in construction of the regression models. We hypothesized that women, physicians born in trans-respect countries, those who did not identify as religious, and resident physicians would have higher scores in all domains. A hierarchically arranged continuum was observed in which all the variables examined were associated with high scores of Human values, and lower scores on Interpersonal comfort. Regarding the Beliefs domain, no differences were observed between resident and senior physicians, and between those working in academic vs non-academic set-ups. Males, individuals who identified as being religious, and those born in transphobic countries had higher odds ratios. Due to the cross-sectional design of the study, causality cannot be inferred from the results.

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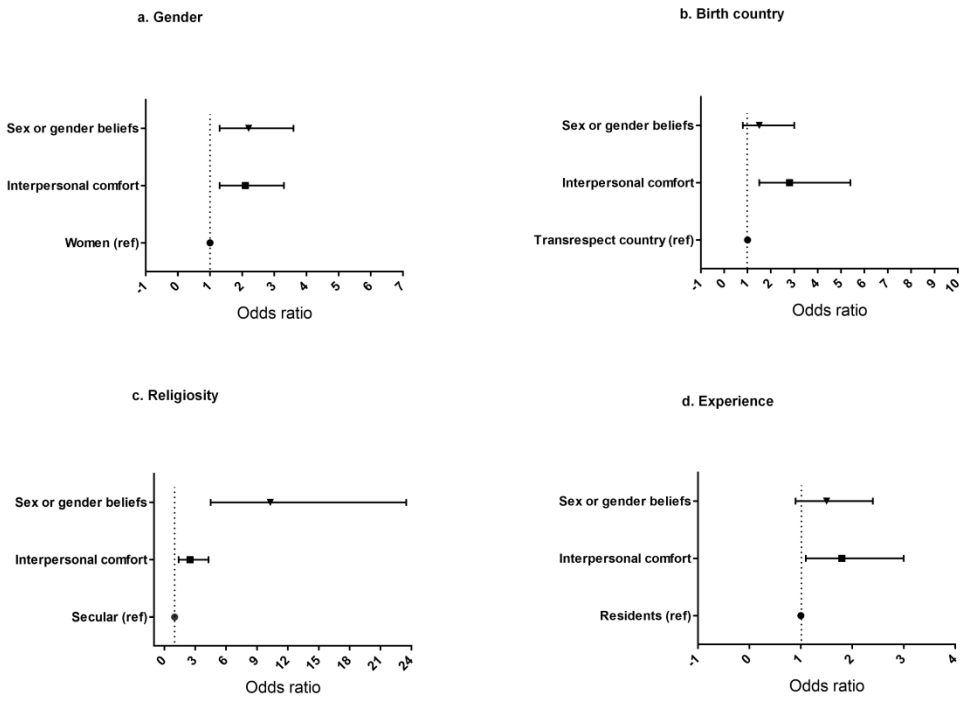

Figure 2: Multivariate analysis of an overall unfavourable (<6) vs. favourable (≥6) response on two domains of the Transgender Attitudes and Beliefs score, according to characteristics of the respondents

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STROBE Statement—Checklist of items that should be included in reports of ***cohort studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	5
		(*b*) For matched studies, give matching criteria and number of exposed and unexposed	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6
Bias	9	Describe any efforts to address potential sources of bias	
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	7
		(*c*) Explain how missing data were addressed	7
		(*d*) If applicable, explain how loss to follow-up was addressed	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7
		(b) Give reasons for non-participation at each stage- not relevant	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	7
		(b) Indicate number of participants with missing data for each variable of interest	
		(c) Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	Report numbers of outcome events or summary measures over time	

Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included (*b*) Report category boundaries when continuous variables were categorized (*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	8
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	9
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10
Generalisability	21	Discuss the generalisability (external validity) of the study results	12
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Not relevant

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.